

Fig. 1

"FatherInfo" Content File

```
<?xml version="1.0" standalone="yes">
<!-- file name :   FatherInfo.xml-->
<FatherInfo   DateUpdated= "February 1, 2000" >
    <Name>
        Yoichiro Sato
    </Name>
    <Work>
        <CompanyName>
            ABC Paper Mill
        </CompanyName>
        <CompanyAddress>
            3-5 Uchisaiwai-cho, Niigata
        </CompanyAddress>
        <CompanyTelephone>
            025 432 3221
        </CompanyTelephone>
        <FatherContactAtWork   Cname= "C1" >
            <DirectPhone>
                025 432 3229
            </DirectPhone>
            <Secretary>
                <SecretaryName>
                    Ken Morita
                </SecretaryName>
                <SecretaryPhone>
                    025 432 3231
                </SecretaryPhone>
            </Secretary>
        </FatherContactAtWork>
    </Work>
    <AnnualSalary   Cname= "C2" >
        10,000,000
    </AnnualSalary>
</FatherInfo>
```

Fig. 2

"MotherInfo" Content File

```
<?xml version="1.0" standalone="yes">
<!-- file name :   MotherInfo.xml-->
<MotherInfo>
  <Name>
    Keiko Sato
  </Name>
  <Work>
    <CompanyName>
      IROHA Bakery
    </CompanyName>
    <CompanyAddress>
      12-8 Terao-cho Niigata
    </CompanyAddress>
    <CompanyTelephone>
      025 876 1453
    </CompanyTelephone>
    <MotherContactAtWork Cname= "H1">
      <DirectPhone>
        025 876 1458
      </DirectPhone>
      <EmergencyNumber>
        025 876 1450
      </EmergencyNumber>
    </MotherContactAtWork>
  </Work>
  <AnnualSalary Cname= "H2">
    8,000,000
  </AnnualSalary>
</MotherInfo>
```

Fig. 3

"SatoBookkeeping" Content File

```
<?xml version="1.0" standalone="yes">
<!-- filename : SatoBookkeeping.xml -->
<SatoBookkeeping>
  <AnnualIncome Cname="Z">
  </AnnualIncome>
  <AnnualExpense>
    <Food>
    </Food>
    <HousingLoan>
    </HousingLoan>
    <Miscellaneous>
    </Miscellaneous>
  </AnnualExpense>
</SatoBookkeeping>
```

Fig. 4

“SatoTelephoneDirecory” Content File

```
<?xml version="1.0" standalone="yes">
<!-- file name : SatoTelephoneDirectory.xml -->
<SatoTelephoneDirectory>
    <Home>
        025 634 9120
    </Home>
    <Work Cname="W">
    </Work>
</SatoTelephoneDirectory>
```

Fig. 5

“SatoBookkeeping” Content File

After execution of the dependency clause[Z, (C2, H2), C2+H2]:

```
<?xml version="1.0" standalone="yes">
<!-- filename : SatoBookkeeping.xml -->
<SatoBookkeeping>
  <AnnualIncome Cname = "Z" >
    18,000,000
  </AnnualIncome>
  <AnnualExpense>
    <Food>
    </Food>
    <HousingLoan>
    </HousingLoan>
    <Miscellaneous>
    </Miscellaneous>
  </AnnualExpense>
</SatoBookkeeping>
```

Fig. 6

"SatoBookkeeping" Constraint File

```
<?xml version="1.0" standalone="no" ?>
<!DOCTYPE Constraints SYSTEM "http://www.iuj.ac.jp/xml/Constraints.dtd">
<Constraints>
  <Target docURL="http://www.iuj.ac.jp/xml/SatoBookkeeping.xml">
    SatoBookkeeping
  </Target>
  <Reference docURL="http://www.iuj.ac.jp/xml/FatherInfo.xml">
    FatherInfo
  </Reference>
  <Reference docURL="http://www.iuj.ac.jp/xml/MotherInfo.xml">
    MotherInfo
  </Reference>
  <Definition>
    <Cvariable >  Z  </Cvariable>

    <math>
      <apply>
        <plus/>
        <ci> C2 </ci>
        <ci> H2 </ci>
      </apply>
    </math>
  </Definition>
</Constraints>
```

Fig. 7

"SatoTelephoneDirecory" Content File

After execution of the dependency clause [W, (C1, H1), buildTree(C1, H1)]

```
<?xml version="1.0" standalone="yes">
<!-- file name : SatoTelephoneDirectory.xml -->
<SatoTelephoneDirectory>
  <Home>
    025 634 9120
  </Home>
  <Work Cname= "W">
    <FatherContactAtWork Cname= "C1">
      <DirectPhone>
        025 432 3229
      </DirectPhone>
      <Secretary>
        <SecretaryName>
          Ken Morita
        </SecretaryName>
        <SecretaryPhone>
          025 432 3231
        </SecretaryPhone>
      </Secretary>
    </FatherContactAtWork>
    <MotherContactAtWork Cname= "H1">
      <DirectPhone>
        025 876 1458
      </DirectPhone>
      <EmergencyPhone>
        025 876 1450
      </EmergencyPhone>
    </MotherContactAtWork>
  </Work>
</SatoTelephoneDirectory>
```

Fig. 8

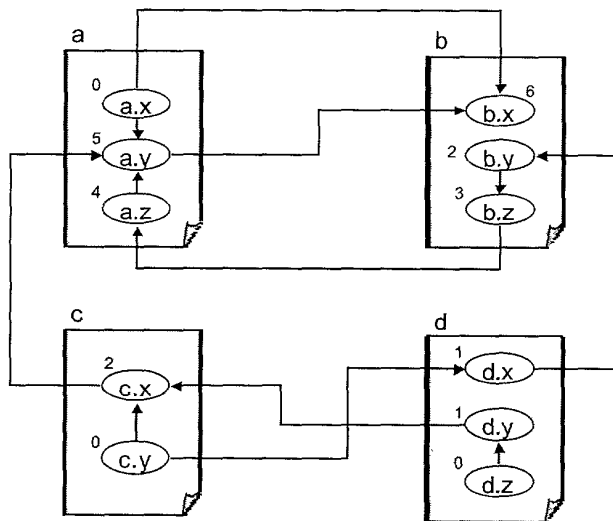
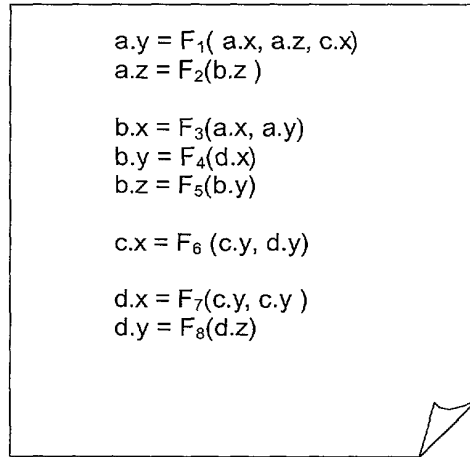
"SatoTelephoneDirecory" Constraint File

```
<?xml version="1.0" standalone="no" ?>
<!DOCTYPE Constraints SYSTEM "http://www.iuj.ac.jp/xml/Constraints.dtd">
<Constraints>
  <Target docURL="http://www.iuj.ac.jp/xml/ SatoTelephoneDirectory.xml">
    SatoTelephoneDirectory
  </Target>
  <Reference docURL="http://www.iuj.ac.jp/xml/FatherInfo.xml">
    FatherInfo
  </Reference>
  <Reference docURL="http://www.iuj.ac.jp/xml/MotherInfo.xml">
    MotherInfo
  </Reference>
  <Definition>
    <Cvariable > W </Cvariable>
    <math>
      <apply>
        <buildTree/>
        <ci> C1 </ci>
        <ci> H1 </ci>
      </apply>
    </math>
  </Definition>
</Constraints>
```


Fig. 9

Content Nets: an Example

- The set of content files : {a, b, c, d}
- Constraint File in which dependency relationships are separated from contents.



Notes:



: Web documents



: Active elements

$a.x, a.y, \dots, d.y, d.z$: Element identifiers

$a.x, c.y, d.z$: Initial elements

Fig. 10

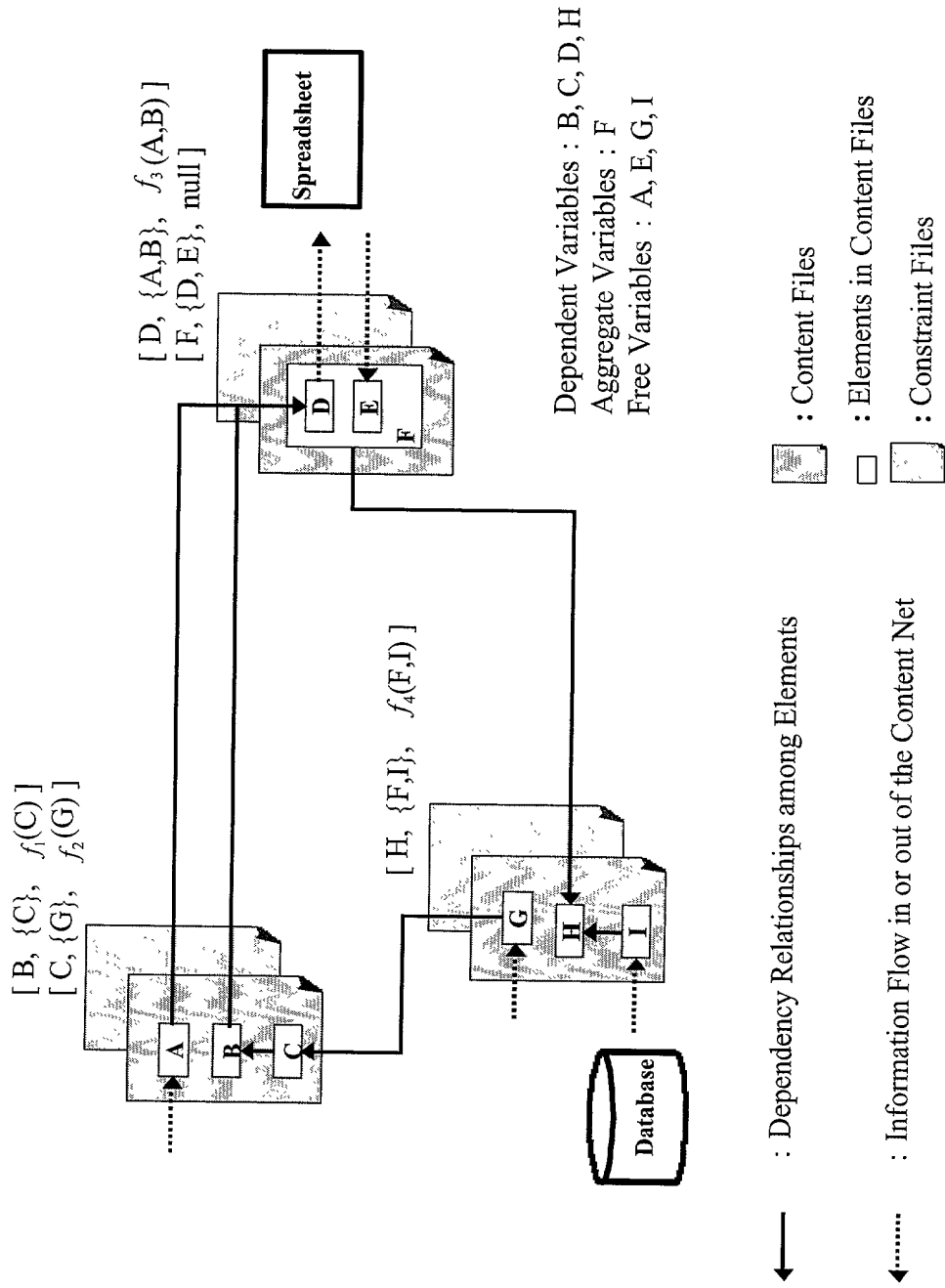


Fig. 11

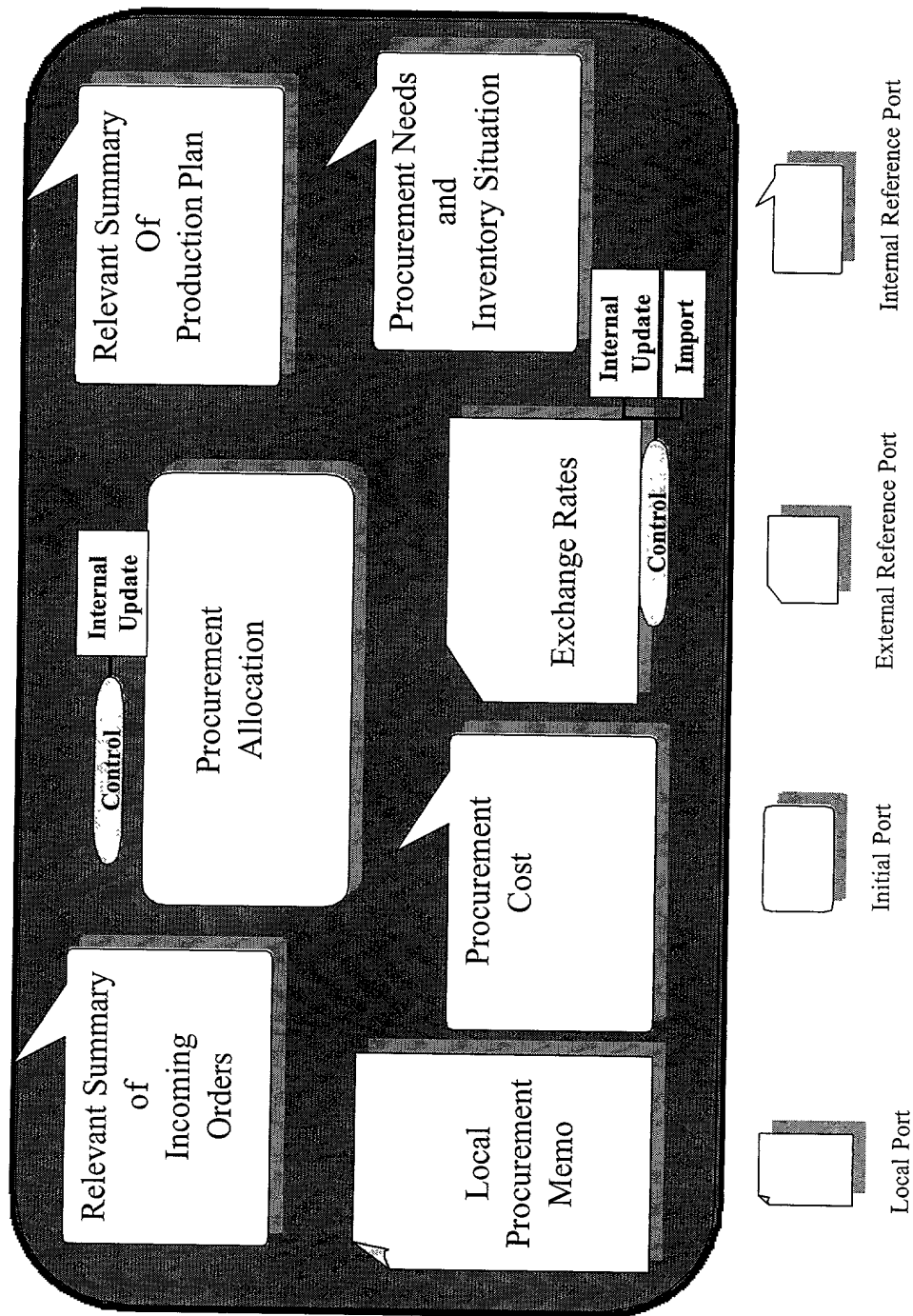


Fig. 12

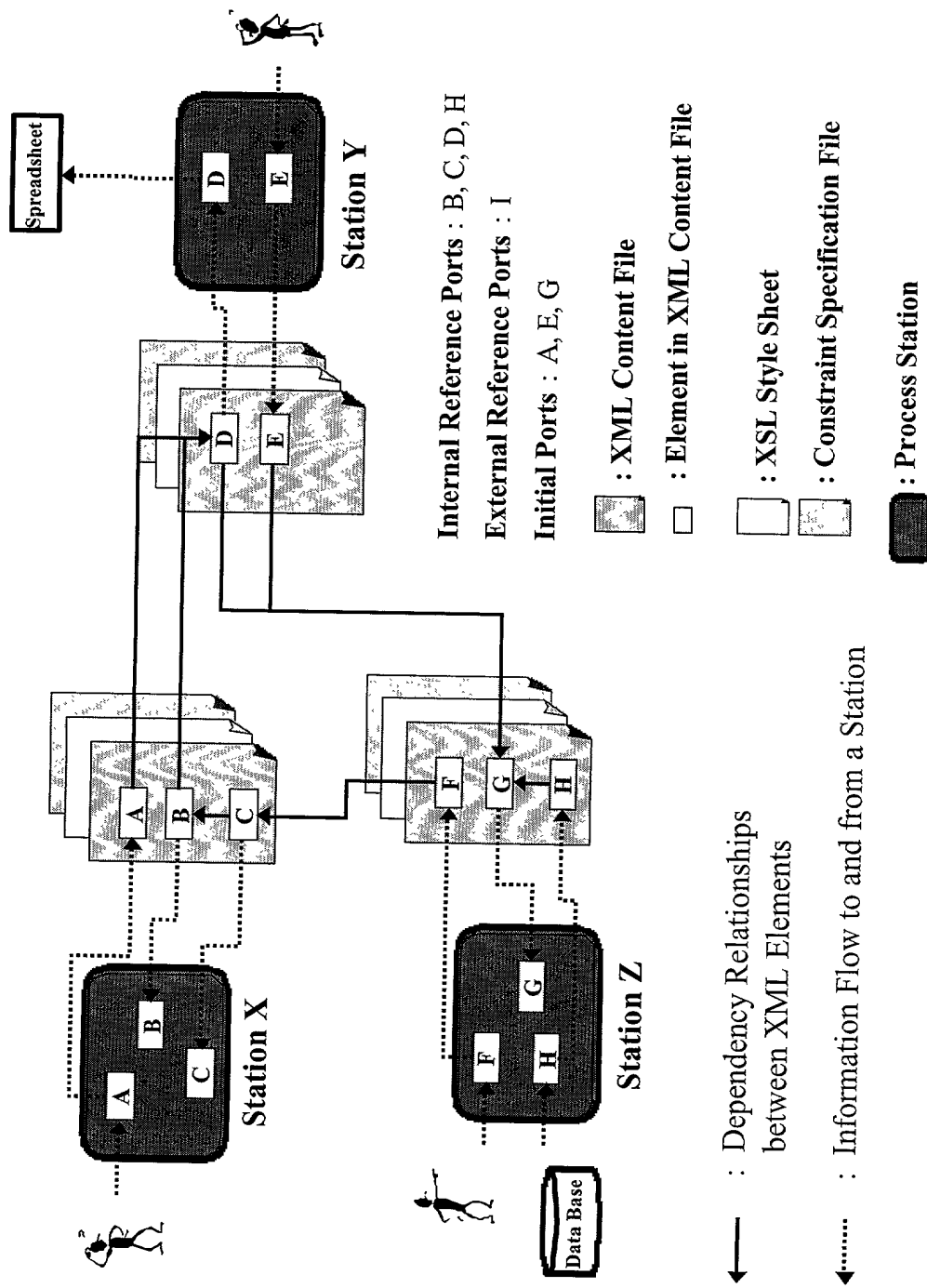


Fig. 13

